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# AGRICULTURAL NEWS LETTER

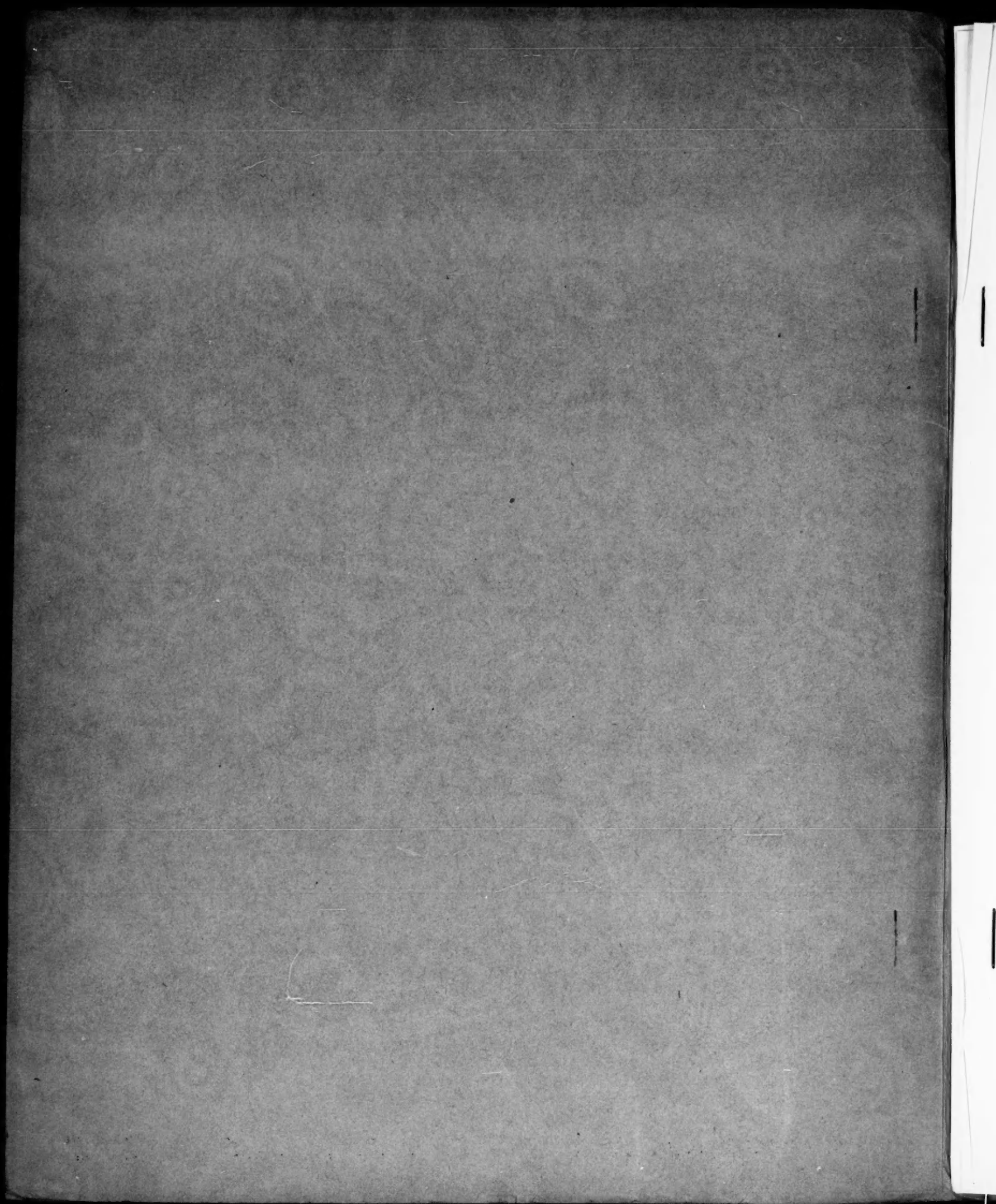
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MAY-JUNE, 1946

This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations of the du Pont Company and its subsidiary companies. It also contains published reports and direct contributions of investigators of agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.



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2,4-D WEED KILLER AVAILABLE IN BOTH POWDER AND TABLET FORMS

Du Pont's new selective weed-killing composition is available in two forms:

1. Du Pont 2,4-D Weed Killer, in powder form.

Can be dissolved in water primarily for large-acreage applications. Spray solutions of various strengths can be made. For instance, two level teaspoonsful of the material in a gallon of water make a 0.1 per cent solution. A pound of the material is required for 100 gallons of 0.1 per cent solution.

2. Du Pont "Karmex" 2,4-D Weed Killer, in tablet form.

One tablet, dissolved in two quarts of water, makes enough solution to cover about 100 square feet of lawn or turf area.

Partial List of Weeds Controlled by 2,4-D

2,4-D effectively controls annual sow thistle, bull thistle, wild carrot, common and mouse-ear chickweed, cinquefoil, white clover, cress, dandelion, dichondra, dock, fleabane, gill-over-the-ground, henbit, heal-all, Japanese honeysuckle, knotweed, lespedeza, lippia, locust, moneywort, annual morning glory, all species of mustard, wild onion, pigweed, pennywort, peppergrass, broad and narrow leaf plantain, purslane, pussy toes, shepherds-purse, speedwell, false strawberry, wild radish, giant and common ragweed, sassafras, sumac, trumpet vine, Virginia creeper, veronica, Whitlow grass, and many others. Tests show promise for control of bindweed, although at present authorities do not recommend 2,4-D for this pest. 2,4-D should not be used on bent grass.

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If 2,4-D is used in equipment that is also employed for other spraying work, such as the application of insecticides or fungicides, clean the equipment thoroughly with water after using 2,4-D. In the case of power equipment, the spray tank should be filled to overflowing with water; the pump should be started and the contents of the tank emptied through the drain outlet. This operation should be repeated until the tank has been drained three times. The drained-off water should not be allowed to come in contact with desirable plants.

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DU PONT 2,4-D WEED KILLER CONTROLS MANY UNDESIRABLE ANNUAL WEEDS IN  
PASTURES AND OTHER TURF AREAS WITHOUT HARMING DESIRABLE GROWTH

.....  
: An annual loss of more than \$3,000,000,000 -- chiefly agricul- :  
: tural -- resulting from weed growth cuts deeply into American :  
: crop profits. Weeds cause the greatest single loss to agricul- :  
: ture, exclusive of soil erosion. :  
: .....

After thorough and careful research on a wide variety of weeds throughout the entire country, Du Pont announces a new weed-control material that, under proper conditions, kills many noxious weeds without harming the desirable growth in such areas as pastures and lawns.

It is Du Pont 2,4-D Weed Killer, which comes in powder form and which has been found extremely effective when used in pastures as a control for many annual weeds. Further research is underway to establish the value of weed killers containing 2,4-dichlorophenoxy-acetic acid for control of some perennial weeds against which it has shown promise of being effective.

"2,4-D is a weed killer of the plant-growth-regulant type, and is selective in its action, which means that under certain conditions, it has the characteristic of killing the undesirable weeds without affecting the desirable growth," according to Du Pont weed-control research scientists, who have conducted or supervised hundreds of tests with this new product.

"First indications of the killing action of 2,4-D on weeds usually show up the first week after application," they state. "Bending, twisting, and splitting are the first signs of an effective kill with 2,4-D. These are followed by yellowing of the foliage, and eventual death and decomposition of the weeds, roots and all."

The Du Pont experts point out that although 2,4-D is effective on a wide variety of farm and turf weeds, the time required for killing different kinds of weeds varies from one to four weeks.

Plants Do Not Grow Selves to Death -- 2,4-D Depletes Food Reserves

"Plants treated with 2,4-D do not grow themselves to death as has been generally reported," they add. "It is believed by some investigators, however, that 2,4-D destroys weeds by forcing them to deplete their food reserves."

A statement by the Grasselli Chemicals Department explains that Du Pont 2,4-D Weed Killer is very stable and does not deteriorate with age,

Continued on next page

and has the advantage of being water-soluble, and economical to use. Rains do not reduce its effectiveness once the spray has dried on the foliage of treated weeds.

#### Spraying Du Pont 2,4-D Weed Killer Makes Weed Control Easy

The statement points out that Du Pont 2,4-D Weed Killer, applied as a coarse spray, seems to give greater kill than when used as a fine mist, giving advantage to applications by spraying equipment that may be obsolete for other purposes. This also means that successful and effective applications on small areas can be made by simple hand methods, with small sprayers or sprinkling cans.

It adds that when used as recommended for control of weeds on pasture and sod land, Du Pont 2,4-D Weed Killer should not injure the grasses.

"The safety of 2,4-D weed killers when used for controlling weeds in growing crops has not yet been completely established," it continues. "However, there is experimental evidence that it may ultimately prove useful in eliminating some weeds growing in certain farm crops. Before using 2,4-D spray in this manner, the definite advice of local weed authorities should be obtained and followed.

"To avoid injury to crops to be planted on 2,4-D treated areas, postpone planting corn and small grain until one month, and other crops until two months after an inch or more of rain has fallen, or the land has been irrigated. If there is any doubt about soil sterility, a test seeding of a few peas or radishes should be made. If they grow, the soil is safe for the planting of other crops."

It is recommended that growers, when attempting large-scale control of weeds other than those listed on page 42, check first with local weed-control authorities or the Du Pont Company to ascertain if control with Du Pont 2,4-D weed killer is possible. In case of doubt, a test spraying on a small area should be made.

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NOTE: For leaflet giving additional information on Du Pont 2,4-D Weed Killer, write the Agricultural Chemical Division, Grasselli Chemicals Department, Du Pont Company, Wilmington 98, Delaware

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"KARMEX", SMALL TABLET OF 2,4-D, DISSOLVED IN TWO QUARTS OF WATER,  
MAKES ENOUGH SOLUTION TO KILL WEEDS IN 100 SQUARE FEET OF LAWN OR TURF

The householder or other small operator whose weed problems involve only a restricted area requiring small amounts of chemical weed killer can now use a convenient tablet form of 2,4-D, compounded to be readily soluble in water.

All the user has to do is to drop one of these easy-to-handle tablets, called Du Pont "Karmex" 2,4-D weed killer, into a couple of quarts of water, which makes an effective weed-killing solution, ready to apply.

A half-gallon of the solution will control the weeds in approximately 100 square feet of lawn or turf area. Six gallons of solution, made by dissolving 12 "Karmex" tablets in six gallons of water, are sufficient to control the weeds in 1,200 square feet of turf area.

Solution Can Be Applied With Hand Sprayer or Sprinkling Can

"Karmex" may be applied to the entire lawn surface in any one of several simple ways. Since it is more effective when applied in a coarse spray or in droplet form, a sprinkling can or hand sprayer is an easy means of applying this material.

"The selective action of 'Karmex' makes it possible to spray the entire sodded area," according to Du Pont research scientists who developed this easy-to-use tablet form of 2,4-D weed killer. 'Karmex' will pick out and kill the weeds, leaving the lawn relatively weed-free. Large quantities of 'Karmex' solution are not necessary for an effective kill. Sufficient should be applied, however, to give complete coverage of the foliage with a minimum of run-off from the weed leaves."

A list of many of the weeds that can be controlled is given on page 42.

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NOTE: For free leaflet giving additional information on Du Pont "Karmex" 2,4-D weed killer, write Semesan Division, Grasselli Chemicals Department, Du Pont Company, Wilmington 98, Del. For sample of "Karmex", enclose 10 cents to cover mailing and handling costs.

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LIFE HISTORY OF NORWAY RAT INDICATES NEED FOR FREQUENT POISONING

A brief review of the life cycle of the brown or Norway rat illustrates the necessity for frequent poisoning, says Iowa Agricultural College Bulletin No. P-33, New Series. It says: "Rats begin to breed at three or four months of age, the gestation period is short (21 to 25 days), and litters vary in size from six to twenty-two. The number of young per litter in Iowa probably averages nine to ten. The brown rat may breed every month in the year, but in this region (Iowa) there are probably six to eight litters per year.

"Using these data, one statistician has estimated that the progeny from one pair of rats might exceed 350 million in three years. Even if, under actual conditions, rats increase by only a small fraction of this rate, it is easy to understand why poisoning must be done frequently in order to keep rat populations within limits."

RATS EAT LARGE AMOUNTS OF FOOD - CAUSE TREMENDOUS DAMAGE ON FARMS

Some farmers, without knowing it, lose as much as \$10,000 annually in giving free room and board to some 5,000 rats that infest their premises, each rat costing at least \$2 for living expenses. This is particularly true for large farming operations such as are found in Iowa.

So say G. C. Decker, H. Gunderson, and H. J. Barre in Iowa Agricultural College Bulletin P-33, New Series, on "Rat Control." They point out that during recent years the rat population has built up until there are more than 5,000,000 in Iowa alone. Other authorities estimate a total of at least 100,000,000 rats in the United States in 1945.

Continued on next page

### Easy Way to Estimate Number of Rats on Iowa Farms

Dr. Gunderson has worked out a formula by which, he says, Iowa farmers can determine the number of rats on any farm in that state. In Iowa State College's "Farm Science Reporter," Vol. 4, No. 1, says: "If you never see rats, but see signs of rats and rat damage, there are from 1 to 100 rats on your farm. If you see rats now and then at night, there are from 100 to 500. If you see rats every night and a few occasionally in the daytime, you are boarding from 500 to 1,000. If you see lots of rats at night and several every day, you probably have 1,000 to 5,000 rats. With each rat costing fully \$2 each year for living expenses, you can easily determine just how big a hotel bill you are paying."

He explains the reason many farmers refuse to believe that rats bleed their pocketbooks is because they have seen only a few signs of the rodents.

"Actually rats very rarely venture from their nests except at night, and are very shy of humans," he says. "In fact, you will not see a rat at all unless it is forced out of its home by sheer pressure of high population."

### 100 Rats Eat 100 Bushels of Corn, Contaminate 300 More Annually

Dr. Gunderson and his associates, in Bulletin P-33, emphasizes the great damage rats do on farms. Rats eat practically anything used as food by man or domesticated animals, they say. For example, one hundred rats will eat 100 bushels of corn, and contaminate an additional 300 bushels each year. Three rats will eat as much as two laying hens. They burrow under and destroy shallow foundations and feeding floors, chew holes in crib roofs, gnaw into crib slats, and threaten the health of both humans and animals, since they may act as carriers of infectious jaundice, endemic typhus, and bubonic plague in man, and trichinosis in hogs. There are many cases on record where rats have even attacked newborn pigs and calves.

Rat damage in corn is particularly important since the grade of the corn may be lowered, due to increased cracked corn, foreign material, and objectionable odors, the Iowa scientists explain, adding: "Furthermore, market for corn contaminated with rat excrement is limited. Livestock, particularly horses and cattle, will often refuse to eat rat-contaminated corn. Rat damage to kernels greatly increases the probability of infestation by stored-corn insects."

### Best Results from Rat Control Obtained in Spring and Fall

Dr. Gunderson, in his "Farm Science Reporter" article, points out that best control from rat poisoning is obtained during the spring and fall months. In late fall the rats move into farm buildings for winter quarters, and will be on hand when the farmer is ready to poison them. In the spring, when the breeding season begins, rats are hungry for any kind of food, and thus are very susceptible to baiting.

Continued on next page

"Effective control during summer and winter months will call for a little more skill and painstaking care, but the results can be just as good," he says.

#### Community Cooperation in Control Campaigns Urged

Iowa's Bulletin P-33 urges that rat control be an integral part of good farm practices. "Since rats move about from farm to farm, especially when they are disturbed by vigorous control campaign on the part of a few farmers, community cooperation is desired," it says. Many such campaigns have been conducted under the supervision of the teacher of vocational agriculture, the county agent, or other local agricultural authority.

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NOTE: Listed as among the 10 outstanding scientific advances in 1945 are improved rat poisons, specifically products referred to in the literature as ANTU (Alpha Naphthyl Thio Urea) and 1080 (sodium acetate.) Du Pont is manufacturing ANTU for sale to rodenticide manufacturers. The story of its discovery and what it can do in the control of Norway rats will be told in the next issue.

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#### "DELSTEROL" SUPPLIES VITAMIN D IN LAYING MASH USED TO SET NEW WORLD RECORDS

The official 1945 world-record-breaking pen of 13 hens was scientifically fed with a ration using "Delsterol" "D"-activated animal sterol as the source of vitamin D.

This pen of single-comb white Leghorn hens, owned by Monroe C. Babcock, Babcock Poultry Farm, Ithaca, N.Y., produced 4,057 eggs, in 51 weeks in 1945. This is an average of about 312 eggs per hen.

This production, recorded in the New York Western Egg-Laying Test, established two new world records -- one for a pen of 13 birds and one for an average egg production of all birds.

The laying mash, prepared under the supervision of poultry-nutrition experts from the College of Agriculture at Cornell University, was well fortified with the necessary vitamins. The "Delsterol", which supplied the required amount of vitamin D in the mash, is chemically controlled throughout every step of its production, is exceptionally stable, does not congeal in cold weather, is always uniform in potency, and does not impart "off" tastes or odors.

Du Pont nutritionists, commenting on the new world records, point out that such achievements are accomplished not from one factor alone, but from a combination of many -- including fine stock, careful management, thorough sanitation, and well-balanced ration.

The formulas for the feed in several other egg-laying contests -- notably in Oklahoma and Missouri -- also specify "Delsterol" as the source of vitamin D.

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### HEXACHLOROCYCLOHEXANE - A PROMISING NEW INSECTICIDE

Hexachlorocyclohexane, developed as an insecticide by Imperial Chemical Industries of England under the names, benzene hexachloride, "666", and "Gammexane", has been widely tested both in Great Britain and the United States by the armed forces and other agencies.

Du Pont early obtained samples of the new material and tested it, both in the laboratory and in the field. Samples were distributed to State and Federal laboratories for evaluation throughout the country.

Many British claims regarding the compound have been verified, but it is definitely not a cure-all for insect problems. Although its insecticidal action is attributed largely to one of several forms of the compound - the gamma isomer - technical hexachlorocyclohexane is a mixture of isomers having a pungent, disagreeable odor. This characteristic odor will limit its use for the control of household, storage, and livestock insects, although it has been found somewhat more toxic to flies and cockroaches than DDT.

#### Has Promise Against Several Major Pests, Including Boll Weevil

In agriculture, it has been found promising against several major pests such as aphids, grasshoppers, wire-worms, and several cotton insects including the boll weevil.

However, the compound is slowly volatile and will not remain effective under atmospheric conditions likely to be found where these pests occur in this country, for much more than 2 to 4 days. It is therefore not effective over as long a period as DDT, and will not be of particular interest for many problems for which DDT is quite effective. From early reports, it is more likely than DDT to injure foliage, especially that of tender truck crops. Preliminary toxicological tests indicate that it has some toxicity to warm blooded animals, and should be used with care.

#### Not To Be Regarded As General Replacement for DDT

The compound is definitely a new weapon in the insecticide field, but its usefulness may be confined largely to those problems where its odor and volatility will not be a handicap. It should not be regarded as a general replacement for DDT.

Du Pont will continue to investigate this new product and its possibilities, including the production of a more effective and less odorous form, and will make promising formulations available for evaluation by qualified investigators throughout the country.

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AIR TRAFFIC INCREASES THREAT OF FOREIGN INSECTS AND PLANT DISEASES

Danger from Foreign Insects Arriving as Airborne Stowaways

"The airplane has brought the Orient and all the islands of the Pacific so close to the United States that there is grave danger of infestation by foreign insect pests arriving here as stowaways in airborne cargoes. These insects, new to this part of the world, are a threat to American Agriculture. Steps are being taken by the California Department of Agriculture and U. S. Bureau of Entomology and Plant Quarantine to meet this problem with new pest quarantine laws and control measures.

"Our insect enemies are costing us now 3 billion dollars annually. They do not need any more reinforcements from other lands. Every year they destroy about 10 per cent of the crops and fruits grown in this country. More than 1 million species of insects have been listed and described by the entomologists, more than all other animal and plant species put together. In fact, if all the insects in the world were weighed on a giant scale, they would overbalance the total weight of all land animals, including man." --Excerpts from article "We Will Have New Pests" by James Senter Brazelton in "Missouri Ruralist", for February 1946.

In one month shortly after the war ended, Florida Plant Board officials inspected 709 commercial planes and confiscated 474 parcels of contraband plants or plant products, including a large number of citrus fruits, which came from 28 foreign countries.

Arthur C. Brown, State Plant Board commissioner of Florida, cites these facts to show that greatly expanded air traffic between such states as Florida and foreign countries will increase the threat of foreign insect pests and plant diseases to the agriculture of this country. He stresses the need for constant vigilance on the part of everyone to combat such dangers.

"Toward the end of the war, arrivals from Buenos Aires, Rio de Janeiro, Trinidad, and other South American and West Indian ports were almost as common at Miami as the buses in your home town," Mr. Brown states. "Plant material from 67 foreign countries passed through the hands of Plant Board inspectors in 1944-45, and infested and diseased

Continued on next page

material was intercepted and destroyed many times. The plant material came from Holland, Russia, Belgium, Arabia, Chile, Egypt, Italy, Palestine, Tibet, India, China, Australia, Bolivia, France, the African Gold Coast, Scotland, Spain, Thailand, Sweden, and other countries."

#### Inspection of All Planes and Luggage Necessary

Mr. Brown points out that inspection of all planes and their luggage and cargo from foreign countries by Plant Board inspectors is necessary to prevent the importation of pests and diseases that might destroy millions of dollars worth of crops in this country in a very short time. As each plane arriving from other countries is a potential carrier of infested or diseased fruit and other crops and plants, inspection of the greatly increased number of planes from abroad has placed a heavier load of work than ever on Plant Board men, he says.

#### Two Foreign Planes Landed on Florida Fields Every Hour in 1945

"To illustrate the problem of air traffic inspection, the number of foreign aircraft landing on Florida fields increased from 2,687 in 1940-41 to 17,398 in 1944-45 (to July 1, 1945)--an average in the latter year of two foreign planes every hour", Mr. Brown explains. "Of course, the majority of the planes that came in during the war were service planes, and the number of service planes has declined since the end of the war, but the same initiative and determination that enabled the United States to master the military airways is now being directed toward making it supreme in commercial air traffic.

"Within the next few months, the number of commercial aircraft arriving at Florida ports from foreign countries is expected to climb rapidly toward the wartime peak."

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:  
: "We are endeavoring in every way we can to keep foreign insects :  
: and diseases from coming in to threaten our agriculture, and we :  
: earnestly solicit the cooperation of every farmer and everyone else :  
: to help us do the job. We urge everyone to report to us as soon as :  
: possible any new or strange plant pest that may show up in gardens, :  
: fields, or groves of our state, for new plant pests, if they do :  
: slip in, may be eradicated if they are detected early enough for us :  
: to take prompt measures against them."--Statement by Arthur C. :  
: Brown, State Plant Board Commissioner of Florida. :  
:  
:.....

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DDT CONTROLS RAT FLEAS IN POULTRY HOUSE IN NEW JERSEY TESTS

Experiments conducted by Dr. John B. Schmitt, associate entomologist at the New Jersey Agricultural Experiment Station, show that DDT is a first-rate insecticide for control of rat fleas in the poultry house. He also found DDT controls bedbugs and lice but is useless against mites.

Basing his recommendations on the results of his tests, Dr. Schmitt says that for control of fleas, a 10 per cent DDT dust can be broadcast on the litter, at the rate of one-fourth pound for each 100 square feet of floor space.

Hens Throw DDT Dust Into Feathers When Scratching Treated Litter

"A 20 x 20 pen would take a pound of the 10 per cent dust," he explains. "As the hens scratch, they throw the dust into their feathers. This will also control lice, which often bother poultry."

Dr. Schmitt says that bedbugs sometimes get so numerous in the poultry house that they hang in strings from the ceilings. To control bedbugs, he says, "The simplest method is to paint the roosts with a kerosene solution containing 3 per cent of DDT. A little DDT dust in the nest boxes will help. This method is effective but slow. It may take a month or more to get all the bugs."

For Quick Cleanup of Large Poultry House

For a quick clean-up of a large poultry house, Dr. Schmitt recommends buying a wettable DDT dust and using it at the rate of four pounds of actual DDT per 100 gallons of water, adding a little extra wetting agent to get better penetration.

"If you buy 50 per cent DDT wettable dust, you will need eight pounds per 100 gallons of water. Put it in an orchard sprayer, keeping the agitator running, and go over the whole house thoroughly, using the orchard spray nozzles," he continues.

"Another good method is to spray the area around the roosts and nests with a kerosene solution containing 3 per cent DDT."

Dr. Schmitt warns that when using a kerosene solution of DDT, workers should wear rubber gloves and put a mask over nose and mouth.

"DDT in oil can be absorbed by the body," he advises.

#####

NEW DU PONT GARDEN DUST CONTAINS DDT, ROTENONE, "FERMATE" AND "ZERLATE"

A thorough dust or spray application of a single pest-control chemical mixture, containing several active ingredients including DDT, can now be made to garden plants at intervals during the growing season to control most insects and diseases of garden crops and flowers.

This new material, known as Du Pont Garden Dust, thus makes unnecessary the bothersome task of frequent applications of several different insecticides and fungicides heretofore needed to control the numerous pests that attack vegetables, fruits, and flowers.

This new combination insecticide and fungicide, considered a boon to small gardeners, contains recommended amounts of DDT, rotenone, and the ferric and zinc dimethyl dithio-carbamates supplied by "Fermate" and "Zerlate" fungicides.

Each of these chemical compounds has a specific job to do. Exact proportions required by the new mixture have been determined by careful research in the laboratory and in the field. The resulting formulation is therefore designed to combat most of the insects and diseases common to the garden crops, except certain varieties of squash, cucumbers, and melons, which may be injured by DDT.

Du Pont Garden Dust can be applied easily with hand or power equipment as a dust or, mixed with water, as a spray. It is most effective when applied before insects become numerous or before plant diseases occur. Applications should be made at 7- to 14-day intervals, until 30 days before harvest, to protect the plants throughout their growth.

A partial list of diseases controlled by this new material includes bean and tomato anthracnose, celery leaf blights, leaf diseases of cucurbits, early blight of potatoes, apple rust and scab, brown rot of stone fruits, pear scab, rose leaf spot, carnation and chrysanthemum leaf spot, and various other rusts, mildews, blights, and leaf spots.

Among the insects against which the new material is effective are various species of ants, aphids, bean leafroller, blister beetles, cabbage worms, canker worms, Colorado potato beetle, cucumber beetles, European corn borer, flea beetles, fleahoppers, gypsy moth, Japanese beetle, various species of leafhoppers, various species of leaf miners, melon worm, Mexican bean beetle, Oriental fruit moth, pepper weevil, rose chafer, squash bugs, various species of stink bugs, various species of thrips, tomato fruit worm and pin worm, and white-fringed beetle.

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#### DU PONT SCIENTISTS ANNOUNCE NEW QUICK METHOD OF ANALYZING DDT

Through use of invisible light beyond the red end of the rainbow, a quick method for analyzing DDT has been developed which makes possible a better control of the quality of DDT insecticides, it was announced by Du Pont chemists at the recent meeting of the American Chemical Society at Atlantic City.

The method and its significance were discussed in a paper by J. R. Downing, W. V. Freed, I. F. Walker, and G. D. Patterson, of the Du Pont Company.

As used in the manufacture of insecticides, explained Dr. Freed, who presented the paper, commercial DDT consists chiefly of three so-called isomers, that is, compounds having the same number and kind of atoms, but differently arranged. In fact, said Dr. Freed, 45 different forms of Dichloro-Diphenyl-Trichloroethane are theoretically possible. He said the most effective commercial products are composed largely of the isomer known technically as 1,1,1-trichloro-2,2-bis (p-chlorophenyl) ethane. The Du Pont scientist pointed out that the proportions of various isomers in a particular lot of DDT influence the effectiveness of the product as an insecticide.

#### Infra-Red Spectrograph Used

Application of the infra-red spectrograph to the study of DDT was developed during the war at the Du Pont Experimental Station under a contract with the Office of Scientific Research and Development. Dr. Freed said infra-red light is made to pass through a DDT solution, and the intensity of the various wave lengths of light that emerge is automatically plotted. The arrangement of the atoms in the molecules of the DDT sample is thus indicated in graphic patterns, as distinctive for each of the chemical compounds present as the fingerprints of a human hand.

By the spectrographic method it is possible to detect the presence of certain isomers and other materials not readily identified by analytical methods now in use. In addition, it is possible to analyze a sample of DDT by the infra-red technique in about thirty minutes, an operation that the Du Pont spokesman said would require days by conventional chemical procedures. Moreover, the spectrographic method is described as being so sensitive that even the minute amount of DDT washed off a wall with a few strokes may be detected.

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FREE-CHOICE METHOD OF ADMINISTERING PHENOTHIAZINE IN SALT CONTROLS  
INTERNAL PARASITES IN SHEEP IN ARKANSAS DURING PAST FOUR YEARS

Results of the use of phenothiazine for control of internal parasites in sheep in Arkansas for four years indicate that this drug mixed with salt in the proportions of one part phenothiazine to nine parts salt is effective, according to M. W. Muldrow, Arkansas Extension animal husbandman.

"Satisfactory results have also been obtained by the use of this free-choice method of salt and phenothiazine in the Experiment Station flock at the University of Arkansas at Fayetteville," Mr. Muldrow reports. "However, this mixture cannot be depended on entirely to control tapeworm, and an occasional dose with the nicotine-copper sulfate standard solution is necessary."

He also points out that the occasional individual in the flock which does not take enough of the salt mixture for some reason will require individual dosing with phenothiazine to avoid some losses.

"Generally, however, the practice of using the free-choice mixture has been sufficiently satisfactory to justify the average flock owner having an adequate supply available for use in a sheltered place where other livestock cannot get to it," he adds.

Mr. Muldrow says the Bureau of Animal Industry suggests that two individual dosings be given the flock during the year, one in the fall and one in the spring after the lambing period is over. These individual treatments may be given as a drench or with feed. A dose for adult sheep is approximately one ounce and for a lamb under 60 pounds in weight about three-fifths of an ounce.

Phenothiazine powder may also be given to a small number of animals by mixing the proper amount in the feed.

Medicated Feed Mixtures

Under experimental conditions, medicated-feed mixtures made according to the following U. S. Bureau of Animal Industry formula have been used successfully for treating groups of five sheep: phenothiazine, about 4½ ounces; molasses, about 4 fluid ounces; water, about 3 fluid ounces; oats and bran, 4 pounds. After thorough mixing of the phenothiazine with molasses, water is added. These ingredients are then mixed thoroughly with the ground feed. In using this group-method treatment, Mr. Muldrow warns that all animals should get approximately equal portions of the feed.

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PENNSYLVANIA FARMERS SAVE TIME AND MONEY BY DITCHING WITH DYNAMITE

A Deserved Tribute to John R. Haswell -- and to Pennsylvania

A recent issue of "Capper's Farmer" says:

"John R. Haswell, extension engineer, has put on dynamite-ditching demonstrations for 25 years with the result that Pennsylvania is one of the leading states in the use of agricultural dynamite for dirt-moving jobs. Pennsylvania Circular 112, 'Drain the Wet Spots',\* has had wide circulation in the state. It has done much to help farmers reclaim water-soaked soil at low labor cost."

\*Reviewed in "Agricultural News Letter," Vol. 13, No. 6, November-December, 1945. Copy available upon request.

The above heading, "Pennsylvania Farmers Save Time and Money by Ditching with Dynamite," is the first sentence of an interesting report on ditching with dynamite as actually done on a number of farms in several counties in Pennsylvania, published in the March issue of "Capper's Farmer."

The article tells how one farmer, Robert S. Murray, aided by Robert H. Rumler, at that time county extension agent in Lycoming county, opened a drainage ditch 680 feet long at a cost of \$32.76 for explosives and fuses and \$8.00 for labor. Mr. Murray had investigated possible use of a ditching machine, and found the cost would be \$60, "so his saving was \$19.24," the report says. It adds: "The ditch opened by dynamite was 3 feet deep and 4 feet wide at the top."

Blast Spreads Dirt Evenly Over Wide Area On Both Sides of Ditch

Another Pennsylvania farmer, F. F. Fry, who blasted a ditch on his land in Blair county, found the cost of dynamite and fuse was about nine cents a stick. The article continues: "The charges were placed 16 inches apart in holes 18 inches deep, and soil was removed to a depth of 36 to 40 inches. Fry estimates it would have cost \$1.20 a running foot to dig the same ditch by hand, and the dirt would have been piled up at one side of the ditch. The blast spread it out evenly over an area of 200 feet on either side of the ditch."

County Extension Association Owns Blasting Machine

The article says the extension association in Montour county owns a blasting machine and wire, and Evan P. Fowler, county agent, has helped a

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number of farmers with ditching. There, Calvin Helwig had a spring outlet that was flooding a large area of pasture. A ditch 50 feet long provided adequate drainage.

"Fowler points out that dynamite is most satisfactory in areas where the soil is thoroly saturated," the article explains. "It is not so effective in dry or slightly moist soil. Other blasting jobs included opening of 200 yards of ditch for Harold H. Shultz and 150 yards for Raymond Hagenbuch. Watson had an outlet opened from the end of a drain tile to a creek."

#### Other Examples In Other Pennsylvania Counties

Other examples reported by "Capper's Farmer" include:

"A. A. Rapp of Venango county opened 400 feet of ditch with dynamite three years ago. With a stick of dynamite placed every 18 inches, he blew a ditch 3 feet deep and 3 feet wide at the top. Results were so satisfactory that he has been employed to blast ditches for other farmers in his county.

"A 200-foot ditch which was blasted out in Cambria county cost Francis Westrick only \$50, H. C. McWilliams, county agent reports.

"Only 600 pounds of dynamite costing \$129, exclusive of blasting caps, were needed to open 2,400 feet of an old ditch at the R. S. Confer farm in Clinton county. Four men and two boys placed the charges in a half day, and only four caps were needed. The ground was thoroly soaked, so charges were placed 18 inches apart. At the W. L. Confer farm in the same county, where the soil was not so moist, it was necessary to set one stick of dynamite every 15 inches in order to blast a ditch 594 feet long.

"Dynamite has been used in Lancaster county to drain low-lying wet spots and useless shallow ponds into nearby streams. F. S. Bucher, extension agent, has helped to blast several ditches varying from 600 to 1,200 feet in length. He uses a stick of 50 to 60 per cent dynamite every 15 inches, and gets a ditch about 4 feet deep and 4 feet wide at the top."

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#### 100 Pounds of Nitrogen Applied to Acre of Pasture Produces Enough Feed to Make Half a Ton of 4% Milk in Maine Tests

Application of 100 pounds of nitrogen (equivalent to about 240 pounds of "Uramon" fertilizer compound) per acre on July 17 in three pasture tests, brought an average increase during the following nine weeks of two tons of green grass or 220 pounds of protein, according to the Maine Agricultural Experiment Station Bulletin 426. This was sufficient feed to produce about 1,000 pounds of 4 per cent milk. Fifty pounds of nitrogen per acre increased the yield nearly a ton of green grass, yielding about 100 pounds of protein.

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: If young cattle lose weight, grow generally weak and anemic, de-  
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: velop pale skin and mucous membranes and rough hair coat, they are  
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: evidencing the usual symptoms of common stomach worm infestation.  
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: Often they develop a "pot belly" and in the later stages swelling  
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: frequently appears under the jaw--the so-called "bottle jaw" or  
:  
: "poverty jaw". Animals most seriously affected are calves and  
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: yearlings; losses rarely occur among older cattle.

: While it is logical to suspect that poor, unthrifty calves and  
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: yearlings: are infected with worms, it is usually advisable to ob-  
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: tain a specific diagnosis by consulting a veterinarian or a diag-  
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: nostic laboratory before undertaking treatment, because the animals  
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: may be suffering from nothing more than malnutrition or some other  
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:  
: condition unrelated to worm infection.

NEW TEXAS BULLETIN SAYS PHENOTHIAZINE IS "MOST EFFECTIVE TREATMENT"  
FOR CONTROL OF COMMON STOMACH WORMS IN CALVES AND YEARLING CATTLE

If a veterinarian tells a cattleman that his young stock is suffering from an infestation of Haemonchus contortus, he will probably also prescribe adequate dosing with phenothiazine as the best-known remedy.

Haemonchus contortus is simply the scientific name the veterinarian would use to differentiate the common stomach worm from other less-menacing types of stomach and intestinal parasites that affect cattle, particularly young stock.

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The reason the veterinarian would prescribe phenothiazine is that this drug has "largely replaced other treatments", as pointed out in a recent bulletin, No. C-222, "Control of The Common Stomach Worms in Cattle," issued by the Texas Agricultural Extension Service. This publication, by Barnes, Smith, and Turk, adds that phenothiazine is also "especially effective" in the control of hookworms and nodular worms. It discusses briefly copper sulfate and tetrachlorethylene as treatments, but adds:

"Phenothiazine is the most efficient treatment in most instances. It may be given as a drench or as a powder in capsules, but the drench is recommended because of ease of administration. The dose is 10 to 12 grams of the powder per 100 pounds liveweight with not more than 60 grams or 2 ounces of the powder to any animal regardless of weight. Weak, anemic calves should be given half a dose, repeated in 7 to 10 days. Do not starve the animals before or after treatment."

#### Dosages of Phenothiazine Drench Recommended

The Texas bulletin says that with the percentage of phenothiazine in the drench known, the required volume to supply proper dosage may be determined. For example, if the drench contains 10 grams of phenothiazine powder per fluid ounce the following dosages may be used: 2 ounces of drench for animal weighing 200 pounds, 3 ounces for 300 pounds, 4 ounces for 400 pounds, 5 ounces for 500 pounds, and 6 ounces for 600 pounds or more. These dosages should be repeated every 16 or 21 days where heavy infection occurs.

"If the drench contains 12 grams per fluid ounce, the amount given should be reduced approximately 1/5," the bulletin explains. "The phenothiazine drench may be given easily with a 4-ounce dose syringe. The syringe is placed in the mouth from the side, and the phenothiazine discharged near the base of the tongue."

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#### U.S.D.A. ISSUES LEAFLET ABOUT "LONGER LIFE FOR POLES AND POSTS"

Chemistry and nature combine to provide an easy, inexpensive way to prolong the life of green saplings or small trees to be used as bean poles, garden stakes, or fence posts.

All that is necessary to increase the natural durability of the wood and make it more resistant to insects and decay is to stand the newly cut saplings or post-size trees in a tub or trough of chemical treating solution, preferably chromated zinc chloride, and lean the tops against a tree or other support, and let nature do the rest. The chemical is taken up in the sap-stream and carried throughout the entire structure of the wood to make it last many years longer than untreated wood.

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According to a leaflet (AIS-36-1946), just issued by the U. S. Department of Agriculture, many kinds of hard- or soft-wood saplings or trees small enough to be handled easily can be treated by the sap-stream method after being cut. The leaflet explains that "the treatment is best when the sap flows most, that is, during spring and summer, especially on bright, sunny days. Best results will be obtained if saplings and small trees are treated immediately after being cut from the stump. The lower branches may be removed for convenience in handling, but leaving a few upper branches attached will help to hasten the treating process."

An alternative method of treating green fence posts calls for cutting them to the desired length and standing them in a trough, with the end to be placed in the ground submerged in the chemical solution.

#### Chromated Zinc Chloride Is First Choice of U.S.D.A.

The leaflet lists chromated zinc chlorides as first choice among effective chemicals, with zinc chloride second, and copper sulfate (bluestone) third. It points out that chromated zinc chloride costs more but protects posts longer, and is less corrosive to wire and staples than is copper sulfate.

The recommendations call for one pound of the chemical dissolved in a half gallon of water to treat one sapling that measures about four inches at the base and is about 30 feet tall. Poles or posts should remain in the tub or trough about six hours or until they have taken up the required amount of the chemical.

The leaflet adds: "If posts are not treated immediately after being cut, or if pitch oozes out of the end of pine posts, remove one inch of wood from the end of the posts just before they are treated. Evergreen trees may be treated, but less effectively, in winter when the temperature is above freezing. They will require about a day to take up the necessary amount of solution. Hardwoods cannot be treated effectively in the dormant season."

The publication, which was issued by the Agricultural Extension Service and the Bureau of Entomology and Plant Quarantine, recommends that "for more detailed information on the chemical treatment of poles and posts, see your county agricultural agent, consult your state agricultural college, or write to the United States Department of Agriculture, Washington 25, D. C."

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